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The effectiveness of pre-emptive sensory integration techniques in reducing physical restraints and seclusions for individuals in psychiatric settings

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CLINICAL SCENARIO: Occupational therapy has the potential to reduce the need for physical restraints and seclusions for individuals living in residential psychiatric treatment facilities. Adults and children experiencing behavioural, psychological and emotional difficulties are subject to further trauma and injury when placed in physical restraints and involuntary seclusions. Multisensory environments hold promise for providing interactive and soothing stimuli that would decrease maladaptive behaviours that often result in unfavourable physical intervention. It is necessary to explore the long-term effects of multisensory environments, as well as methods for individualizing sensory stimuli to achieve optimal results.

FOCUSSED CLINICAL QUESTION: How does sensory integration reduce the need for physical restraints and involuntary seclusion in individuals living in residential psychiatric treatment facilities?

SUMMARY of Search, 'Best' Evidence' appraised, and Key Findings:

- A total of six research articles covering the effectiveness of multisensory environments in reducing maladaptive behaviors were analyzed by this writer.
- The pilot study by Anderson, Bird, MacPherson, McDonough and Davis (2011) was determined the "best evidence" evaluated.
- The article assessed 12 older adults (age 81-94) with dementia living in a residential aged care facility.
- Residents were exposed to 3 sessions in a multisensory environment and 3 sessions in a garden over a 6-week period.
- Results indicate that there was no significant difference in behavior between the multisensory and garden environment.
- Although the facility mentioned in this article didn't employ the use of physical restraints and seclusions, resident's performance was coded based on observed behaviors ranging from smiling to physical aggression.
- Accounting for implementation difficulties, it was suggested that facilities refrain from installing multisensory rooms and implementing related programs until large scale studies are conducted that produce definitive results.
- Mohr and Anderson (2001) suggested that the current crisis-management

model that often results in physical restraints and seclusions is neither supported by empirical evidence, nor an effective intervention as part of milieu management.
- Rutledge and Pravikoff (2003) identified a hierarchy of behaviors that serve as a predictor of violence. Behavioral indicators that escalate to a level of self-harm or physical harm to others are justification for physical restraint and seclusion.
- Shapiro, Parush, Green and Roth (1997) and Lotan and Gold (2009) suggested that multisensory rooms could be used as a therapeutic treatment intervention for children with intellectual disabilities.

CLINICAL BOTTOM LINE: Results from the found research indicate that multisensory environments have an initial positive effect on individuals displaying maladaptive behaviours. Research also indicates that maladaptive behaviours which escalate to a level of unsafety often result in involuntary physical restraints and seclusions. It stands to reason that proactive use of multisensory interventions could decrease the manifestation of maladaptive behaviours that often result in physical restraints and seclusions. Occupational therapy has the unique ability to assess sensory needs that best meet the needs of the individual, maximizing the benefit of multisensory interventions.

Limitation of this CAT: This critically appraised topic has been peer-reviewed by one other MOT2 student. It is important to note that the writer is not an expert on this topic, and the literature reviewed was not an exhaustive search.

SEARCH STRATEGY:

Terms used to guide Search Strategy:

- **P**atient/Client Group: adolescents; residential treatment, residential aged care facility
- **I**ntervention (or Assessment): Snoezelen, multisensory, sensory integration, alternatives
- **C**omparison: non-multi sensory environments
- **O**utcome(s): agitation resulting in physical restraint and seclusion

Databases and Sites Searched	Search Terms	Inclusion/Exclusion Critera	Notes
CINAHL	'Snoezelen' &		3 results Shapiro, M., Parush, S., Green,

	'Maladaptive Behavior' 'Child Psychiatry' & 'Restraints'		M., & Roth, D. (1997). Anderson, K., Bird, M., MacPherson, S., McDonough, V., & Davis, T. (2011). 8 results Mohr, W., & Anderson, J. (2001).
MEDLINE	'Snoezelen' 'Snoezelen' & 'Aggression'		68 results Lotan, M, & Gold, C. (2009). Singh, N., Lancioni, G., Winton, A., Molina, E., Sage, M., Brown, S., & Groeneweg, J (2004).
PsycINFO	'Psychiatric Unit' & 'Restraint' & 'Seclusion'		8 results Rutledge, D., & Pravikoff, D. (2003)

INCLUSION and EXCLUSION CRITERIA

- Inclusion:
  - Peer reviewed articles
  - English language
  - Linked to full text
  - Snoezelen
  - Multisensory Environments

- Exclusion:
  - Casual leisure activity/recreation
  - Non-English language
  - Chronic pain

- Maternity
- Stroke/brain injury

RESULTS OF SEARCH

Table 1: Summary of Study Designs of Articles retrieved

Study Design/ Methodology of Articles Retrieved	Level	Number Located	Author (Year)
Within-subjects mixed method design (quan); grounded theory (qual)	III (quan) N/A (qual)	1	Anderson, K., Bird, M., MacPherson, S., McDonough, V., & Davis, T. (2011).
Meta Analysis	I	1	Lotan, M, & Gold, C. (2009).
Historical Research/Ethical Inquiry	N/A	1	Mohr, W., & Anderson, J. (2001).
Experimental cross-over design	IV	1	Shapiro, M., Parush, S., Green, M., & Roth, D. (1997).
Repeated measures counterbalance design	IV	1	Singh, N., Lancioni, G., Winton, A., Molina, E., Sage, M., Brown, S., & Groeneweg, J (2004).

BEST EVIDENCE

The following study/paper was identified as the 'best' evidence and selected for critical appraisal. Reasons for selecting this study were:

- Most articles reviewed examined the effectiveness of multisensory rooms as compared to non-stimulating environments. This article examined the effectiveness of multisensory rooms compared to the multisensory components of an outdoor garden, providing a control condition.
- Not only did the study examine the effectiveness of the intervention, but also the feasibility of implementing multisensory room sessions in residential facilities.
- The results were inconclusive due to implementation difficulties, but this limitation highlighted the realistic challenges of disrupting established routines and enacting change in institutional settings.

SUMMARY OF BEST EVIDENCE

Table 2: Description and appraisal of: Findings from a Pilot Investigation of the Effectiveness of a Snoezelen Room in Residential Care: Should We Be Engaging with our Residents more? by Anderson, K., Bird, M., MacPherson, S., McDonough, V., & Davis, T. (2011)

Aim/Objective of the Study/Systematic Review: the objective of this pilot investigation was to determine the effectiveness of multisensory environments on adults with dementia living in long term care facilities. Behaviour and level of engagement were examined; duration of effects and staff perception were also evaluated. The study sought to determine if prescribed multisensory environments were more effective than a garden, where sensory stimuli are encountered arbitrarily. Finally, the study explored the feasibility of implementing a multisensory room, and the practicality of consistent use of this intervention by staff members.

Study Design: within-subjects mixed method design (quantitative); grounded theory (qualitative)

Setting: 176 bed residential aged care facility (RACF) in Canberra, Australia

Participants: N=12; Researchers approached the facility and asked staff to nominate clients who they believed would benefit from the intervention. Clients were between 81 and 94 years old (mean age 89), had a diagnosis of dementia, and were permanent residents of the facility. Clients had an average Mini Mental Status Exam score of 5.7 of out 30, and displayed behavioural and psychological symptoms of dementia. Per staff report, all of the participants displayed challenging behaviors that contributed to moderate stress levels among staff members. Participants chosen for the study were those whose guardians gave consent.

Intervention Investigated: 12 staff members who underwent multisensory therapy training were randomly assigned to one of the 12 participants. Staff members were registered nursing, personal care assistants/nursing aides, and an activity coordinator and had an average of 7.8 years of experience working in residential care. Over a 6 week time period, staff member engaged their client in 6 multisensory sessions: 3 in the Snoezelen and 3 in the garden. Staff were encouraged to engage their client for at least 20 minutes per session, and were given the option of PRN sessions if their client appeared distressed. Staff were asked to fill out additional questionnaire regarding client's emotional state pre and post intervention if PRN sessions were utilized.

Control: Garden – opportunities for sound, sight, smell and touch = aviary, trees, flowers, fish pond, interaction with staff member

Experimental: Snoezelen (multisensory therapy) – window, vibrating chair and footstool, mirror ball, coloured light projector, disc projector and effects wheel, fiber-optic spray, and a bubble tube. CD player with ambient sound a music options, aromatherapy, and a range of soft toys and rubber balls.

Outcome Measures: Time sampling was used to code observations of behaviours before, during, and after Snoezelen and garden sessions. 3 researchers observed and coded the behaviours of the residents, but due to space limitations only 1 researcher could observe at any given time. Behaviours were grouped into 4 broad categories: *very engaged, engaged, neutral, disinterested/disturbed.* Observers sat in the Snoezelen room or garden and made direct observations of physical cues and

facial expressions using an 'on'/'off' coding method in which they would observe for a given time, and record for an equal amount of time. Participants were also observed for 6 minutes before and 6 minutes after the session to determine pre and post levels of engagement. 2 months following the intervention, staff members were interviewed by a clinical psychologist in an open discussion format. Using a grounded theory approach, 3 themes arose: *difficulties in implementation, benefits of the program, and Snoezelen room vs. garden.*

Main Findings: Quantitative data was collapsed into two categories: immediate effects of multisensory therapy on resident behaviour, and measuring change over timel; and differences between Snoezelen and garden sessions. A repeated measure t test was used to determine the immediate effects of the Snoezelen room and garden on client behaviour. The differences in disturbed/disengaged behaviours before and after Snoezelen room sessions were insignificant (p=0.09). Behaviours before and after garden sessions were less reliable due to observation difficulties, but still yielded insignificant results (p=.22). 2x2 repeated analyses of variance were used to determine change over time and difference between Snoezelen and garden sessions. Overall, results were insignificant for time and location, and there were no significant interactions between these 2 factors.

Table #3

Coding Guide for Behaviours

Behaviour	Coded Level of Engagement
Affection	Very engaged
Laughing	Very engaged
Smiling	Very engaged
Initiating Conversation	Very engaged
Pointing/Gesturing	Very engaged
Responding to conversation initiated by another	Engaged
Describing the materials	Engaged
Interacting with materials by touching them	Engaged
Indicating interest	Engaged
Purposeful walking	Engaged
Scanning the environment	Neutral
Dozing/sleeping	Neutral
Not classifiable (e.g., eating)	Neutral
Pacing	Disturbed/disengaged
Calling/yelling out	Disturbed/disengaged
Cyring/tearing/whimpering	Disturbed/disengaged
Other signs of agitation/distress/restlessness	Disturbed/disengaged
Verbal aggression	Disturbed/disengaged
Physical aggression	Disturbed/disengaged
Withdrawn	Disturbed/disengaged

Table adapted from: Anderson, K., Bird, M., MacPherson, S., McDonough, V., & Davis, T. (2011). Findings from a pilot investigation of the effectiveness of a Snoezelen room in residential care: should we be engaging with our residents more? *Geriatric Nursing*, *32*(3), 166-177. (Original table © 2011 Geriatric Nursing)

Table #4

Means and Standard Deviations for Very Engaged, Engaged, Neutral, and Disengaged Observations, Observed Pre-session and Post-session from Early in the Program

	Presession	Postsession
	M(SD)	M(SD)
Snoezelen	28.21 (.36)	10.19 (.15)
Garden	Insufficient data to compare pre and post session behaviour	Insufficient data to compare pre and post session behaviour

Table adapted from: Anderson, K., Bird, M., MacPherson, S., McDonough, V., & Davis, T. (2011). Findings from a pilot investigation of the effectiveness of a Snoezelen room in residential care: should we be engaging with our residents more? *Geriatric Nursing*, *32*(3), 166-177. (Original table © 2011 Geriatric Nursing)

Table #5

Means and Standard Deviations for Very Engaged, Engaged, Neutral, and Disengaged Observations, Observed within Sessions over Time

	Time 1	**Time 2**
	M(SD)	**M(SD)**
Very Engaged		
Snoezelen	.30 (.20)	.24 (.19)
Garden	.24 (.22)	.27 (.12)
Engaged		
Snoezelen	.48 (.27)	.49 (.20)
Garden	.52 (.28)	.53 (.19)
Neutral		
Snoezelen	.16 (.28)	.21 (.20)
Garden	.20 (.37)	.16 (.19)
Disengaged		
Snoezelen	.06 (.10)	.08 (.15)
Garden	.04 (.08)	.04 (.09)

Table adapted from: Anderson, K., Bird, M., MacPherson, S., McDonough, V., & Davis, T. (2011). Findings from a pilot investigation of the effectiveness of a Snoezelen room in residential care: should we be engaging with our residents more? *Geriatric Nursing*, *32*(3), 166-177. (Original table © 2011 Geriatric Nursing)

Original Authors' Conclusions: the results of this study were fraught with implementation difficulties, which made it challenging to gather strong evidence. The author suggests the need for more large-scale and well-designed studies before definitive conclusions can be drawn regarding the efficacy of the Snoezelen room. The benefits can only be achieved if staff members have the time to implement multisensory therapy, which is not consistently possible in institutional settings. Due to the high cost of the Snoezelen room (AU$10,000), and inconclusive results, the

author suggests 'that any potential endorsements should wait until a number of avenues have been explored,' (p.176).

Critical Appraisal: The main limitation concerning the research question is that the study did not directly address the benefits of Snoezelen in reducing the need for physical restraints and seclusions for individuals in psychiatric settings. There was an overall decrease in disengaged/disturbed behaviors, which are often the precursor for restraints and seclusions; however, implementation difficulties produced weak evidence regarding the efficacy of Snoezelen rooms.

Validity: Cohen's kappa was used to determine the interrater reliability of the independent coding of focus group transcripts. Reliability measured .92.

Summary/Conclusion: In this article, adults with dementia showed both an increase in engaged behaviours, and a decrease in disengaged behaviours when in the Snoezelen room. Although the results were not clinically significant, the study paved the way for future research to investigate the possible benefits of prescribed multisensory environments as an alternative to restraints and seclusions. The other four studies in consideration also realized the short-term benefits of the Snoezelen in decreasing maladaptive behaviours. This information has implications for psychiatrists, mental health nurses, occupational therapists, school teachers/administrators and direct care givers who are constantly faced with challenging and aggressive behaviours. Institutional psychiatric settings are in need of a paradigm shift away from the crisis-management model that addresses sensory deficits as well as behavioural and psychological needs. Occupational therapists have the unique ability to proactively address these sensory needs, facilitating adaptive behaviours and enhancing quality of life.

Table x: Characteristics of included studies

	Intervention Investigated	**Comparison Intervention**	**Outcomes Used**	**Findings**
Lotan, M, & Gold, C. (2009).	Meta-analysis of the effectiveness of Snoezelen multisensory environments for individuals with intellectual disabilities	Informally compared to individuals with intellectual disabilities not exposed to Snoezelen multisensory environments	Reduction of maladaptive behaviours and enhancement of adaptive behaviours	The Snoezelen approach yielded a large effect size in adaptive behaviours with generalization to the client's daily life
Mohr, W., & Anderson, J. (2001).	To refute faulty assumptions regarding the use of restraints with children;	N/A: qualitative literature review	N/A	Alternative to the crisis-management approach involving physical restraints

	discuss alternatives for responding to children in crisis.			needs to be developed and implemented for children experiencing difficult behaviours
Shapiro, M., Parush, S., Green, M., & Roth, D. (1997).	The efficacy of the Snoezelen in the management of children with mental retardation who exhibit maladaptive behaviours	Compared to children who were exposed to the "Playroom" condition where sensory stimuli was available but not prescribed	The Behaviour Checklist (BC); adaptive vs. maladaptive behaviours; duration of behaviours; heart rate (electrocardiogram monitor)	Children in the Snoezelen room exhibited more adaptive behaviours, less maladaptive behaviours, and a slower resting heart rate than children in the playroom.
Singh, N., Lancioni, G., Winton, A., Molina, E., Sage, M., Brown, S., & Groeneweg, J (2004).	The effects of Snoezelen (multisensory room), ADL skills training, and vocational skills training on aggression and self-injurious behaviours with adults with mental retardation and mental illness.	Informally compared to adults with MR/MI who did not receive any intervention	Aggressive behaviours; self injurious behaviours	Fewer acts of aggression and self-injurious behaviour were committed under the Snoezelen condition than with ADL/vocational skills training. Order of intervention was not significant.

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

• The research viewed provides evidence that multisensory environments provide short term reduction in maladaptive behaviors in clients with a variety of developmental, behavioral, and age-related conditions.
• Occupational therapy has the unique ability to identify specific sensory needs, and individualize sensory environments accordingly.
• Multisensory environments could have beneficial outcomes in settings outside residential treatment facilities (schools, foster homes, private clinics, acute care, etc).
• The found research demonstrates the importance of maximizing the benefit of multisensory interventions by individualizing sensory stimuli to best meet the needs of the individual.

• An Innovative Practice Project (IPP) could introduce the concept of sensory integration dysfunction, as well as multisensory environments to local residential treatment facilities.
• Further research could explore whether multisensory environments have a greater impact on behavior than other stimulating environments (such as gardens), or positive interactions with other individuals. Determine if the sensory input provided by a multisensory environment is imperative for decrease in maladaptive behaviors.
• More research could also aim to discover methods for increasing long-term effects and generalizability of multisensory environment intervention.

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